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Wait, William Bell

Origin of the New York Institution for the Blind

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[1892]

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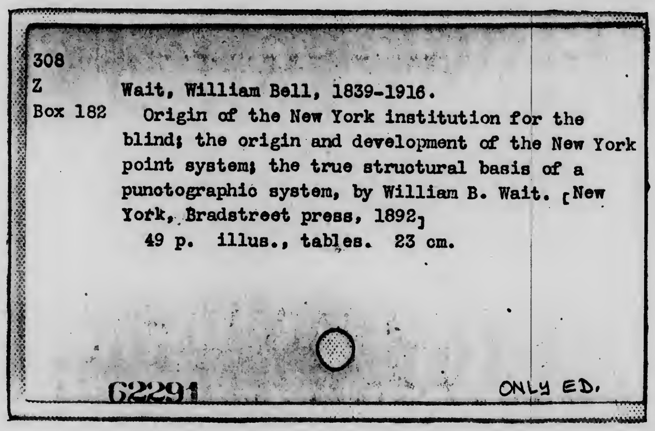

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THE ORIGIN AND DEVELOPMENT OF THE NEW YORK POINT SYSTEM.

THE TRUE STRUCTURAL BASIS OF A PUNCTOGRAPHIC SYSTEM.

BY WILLIAM B. WAIT.

BRADSTREET PRESS,
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Origin of the New York Institution for the Blind.

THE ORIGIN AND DEVELOPMENT OF THE NEW YORK POINT SYSTEM.

The True Structural Basis of a Punctographic System.

A part of my report for the year ending September 30, 1891, consisted of an article called "A Review of the Origin and Development of Embossed Literature and Music for the Use of the Blind, with Special Reference to the Educational Interests of the Blind in the United States."

The publication of this sketch called out two conjoint criticisms, into both of which has been woven, *ad captandum*, much erroneous and misleading matter in regard to the following subjects:

1st. The origin of the New York Institution for the Blind.

2d. The origin and development of the New York Point System of embossed printing and writing.

3d. The true basis and relative merits of punctographic literary systems.

4th. The relative merits of punctographic systems of musical notation.

Having been widely circulated, it will not be inappropriate to point out the misstatements and specious arguments which form the substance of both of these criticisms.

The first of these incorrect statements to be noticed are the following in regard to the origin of the New York Institution for the Blind.

(*a*) "A pamphlet 'published by order of the Managers,' in 1833, entitled, 'An Account of the New York Institution for the Blind,' shows that it owes its origin to the generosity and devotion of this philanthropist" (Dr. John D. Russ).

(*b*) "With no means for starting the enterprise, and no person to be found in this country who was acquainted with methods of instruction, the proposed school would have been indefinitely postponed had not Dr. Russ again come forward and volunteered to open a school at his own expense. Accordingly, he commenced March 15th, 1832, with three boys, * * * and on the 19th of May three other pupils were added to the number. The school was established at 47 Mercer street, and here he taught his little class daily."

(*c*) "He gave exhibitions with his (?) pupils, and awakened such a general interest in the undertaking that the necessary amount (?) was raised, and the New York Institution for the Blind was established on a permanent foundation."

In these statements the pamphlet which is held out as their authentic basis is neither fully nor fairly quoted, for it distinctly states that the Institution owes its origin more directly to the efforts of Dr. Samuel Ackerly and Samuel Wood. This was the original and official record, which could not have been questioned with propriety at any time, much less after a lapse of nearly sixty years.

The record of initiative events shows that Dr. Russ was not a member of the parent Society, nor one of the signers to the petition for incorporation. He was not a charter member, nor was he named as a manager in the Act of Incorporation.

The following chronological statement of occurrences, as shown by the records, summarizes the relations which existed subsequent to the incorporation:

1832, February. Dr. Russ was chosen a manager.

1832, March. Three blind children were taken from the Almshouse by Dr. Ackerly and Dr. Russ, *to whom the matter had been referred with power to provide board and instruction.*

"A private house *was hired by the teacher*, and for the rent of which the President (Dr. Ackerly) became security." (Extract from first annual report.)

"By the persevering efforts of *Samuel Wood* and others, funds were raised to pay debts to January 1st, 1833."

1833, October 10. The new premises on Eighth avenue were occupied on this date. From this time Dr. Russ received compensation for his services, which until then had been rendered gratuitously.

1834, November. Dr. Russ proposed that if a competent assistant were procured he would for a certain sum, with half board, give from three to six hours daily instruction, except Sundays, attend to its general concerns and live out of the Institution.

1834, November. Employment of assistant authorized for six months.

1834, December. Term of Dr. Russ as a manager expired. Not reëlected.

1834, December. Dr. Russ proposed that he should be moved back to the Institution on three weeks' notice, if at the end of six months things were not satisfactory.

1835, January 14th. No agreement reached with Dr. Russ. New committee authorized to settle and pay the accounts of Dr. Russ and to engage him as Superintendent at a salary named, and with such privileges in the house and garden and on the premises as they may think proper to grant him.

1835, January 31st. Committee appointed to settle with Dr. Russ reported their interview with him and the correspondence which passed. "It was unanimously resolved that the letter from Dr. Russ, dated January 20th, 1835, be considered as his resignation, and that he be notified thereof, and also that his salary will cease from and after the second day of February next, 1835."

The greatest number of pupils up to this time appears to have been sixteen.

In regard to statement *c*, relating to the financial foundation of the Institution, it must be said that there is no justification for it.

The degree of "general interest" which was awakened by the exhibitions and their value as a source of revenue may be measured by the actual results. The total amount received from these exhibitions—

In 1832–33, was	$504.91
In 1834	121.80
Total	$626.71

The funds received from other sources were:

1832–33	$8,359.52
1834	5,974.60
Total	$14,334.12

These figures show that the assertions in statement *c* are not borne out by the facts.

It appears, moreover, that the services of Dr. Russ were not more personal or generous than those of others.

The Board consisted of twenty members, most of whom, as members of the *parent Society*, of the Corporation, of the Board of Managers, and as executive officers of the Board, were actively engaged in founding and building this Institution, both before Dr. Russ was connected with it and long after his connection with it had closed. Not only did they give their important services *gratuitously*, but the names of Dr. Samuel Ackerly, Samuel Wood and many others appear in the lists of contributors, from which the name of Dr. John D. Russ is absent.

But there was an event, not referred to above, which had a decisive influence in determining the final and permanent establishment of the Institution.

On November 6th, 1833, the President, Dr. Ackerly, announced that "the new Asylum on Eighth avenue, *provided by the liberality of Mr. James Boorman*, was first occupied on the 10th day of October, 1833."

The liberal propositions of Mr. Boorman, by which the Institution was established in the location where it now is, were in part as follows. Under date of June 1st, 1833, he says: "I will execute a lease of it (land and buildings) to the Society for the term of ten years from the first of May last, for the rent of a peppercorn per annum, and the payment of all taxes and assessments." The proffer was coupled with liberal provisions for the sale of the property to the Institution upon easy terms. The property included ample grounds and a commodious building, 108x54 feet. The lease was made and the premises finally purchased, as proposed by Mr. Boorman.

The Criticism says: "In his efforts for the blind he labored with a single-hearted devotion to their welfare; and so devoid was he of self-seeking in any form that, long ignored,—consciously (it must be) by some and unwittingly by others,—the name of this unselfish and tireless benefactor is sinking into that sea of oblivion in which usurpers gladly bury those whose noble uprightness silently rebukes their career. The notice of his work has therefore been a little more extended *than the reference to his point system would otherwise have required*."

In the light of the facts cited, this statement is seen to be a mixture of hyperbole and audacious pretence.

Furthermore, the sentence which I have italicised furnishes evidence of the weakness and insincerity of the pretence made in regard to the relations of Dr. Russ to embossed literature and to the New York Point System, which matter will now be briefly noticed. From a private letter written by Dr. Russ I make the following extract:

(*d*.)

POMPTON, October 27, 1878.

J. W. SMITH, Esq.

Dear Sir: Yours of the 23d ultimo has been received, for which accept my warmest thanks. Its contents, however, surprise me very much. My two dot recurrent alphabet, or (for short) the

recurrent alphabet, as I believe there was no other alphabet before mine in the English language based upon that principle, was taught to one or more of the pupils of the New York Institution for the Blind a year or two before Mr. Wait was connected with the Institution, and the several papers published by me to introduce the system were distributed to the several Institutions in the United States, and especially to the New York Institution; and the rule, or guide, for writing, which is now in use in the Institution and recommended by Mr. Wait was invented and prepared by me, and left at the Institution before he was appointed superintendent, and the distances and dimensions of the different apertures of the rule published in every number after the third, for at least two years. It is a very singular fact, if he invented it, that the two inventions should run in the same groove *exactly*. I am always ready to give Mr. Wait all the credit due him for his slight modifications of my alphabet, and for his efforts to place it before the blind; but I cannot afford to allow, and I should suppose that Mr. Wait's *self-respect* would prevent his *claiming*, an invention which so demonstrably and unquestionably belongs to me. Take away the two principal features of the alphabet he claims; namely, its recurrent character and its substitution of two dots instead of three, and what is there left—with the exception of a character for *that*, and the writing of *t* with one, *n* with two, and *u* with three dots on the bottom of the the line, an idea which, in presenting an entirely new alphabet without the means of testing it except by my own practice, I was afraid to present because it was introducing letters which, when standing alone, had no certain identity, and which, in certain connections, might create great embarrassment to the reader and sometimes perhaps wrong construction? The use of these positional or convertible letters is the only point which I have ever had any doubts about; and it was only the experience of Mr. Wait with his pupils which led me, yet doubtingly, to adopt them.

I am surprised that Mr. Wait should be so afraid of the mention of my name in your paper, and still more surprised that the Convention should have so lent themselves to his views as to order it stricken out of your paper and to direct the suppression of my letter to you. Were you all afraid of Mr. Wait? * * * * I am rejoiced to learn that you are making efforts to introduce the recurrent principle into the Braille character. I proposed such a character in my third number, and printed enough in it to show that it saved nearly one-third in space; but I did not consider it as flexible as the two dot, and did not urge it further. I am glad you have resumed the work. Try what you can make of it; and, if you find it in any way superior to the two dot, I wish you success. I wish you would give me the statistics of your report.

What have I done that my name should so unceremoniously be kicked out of the Convention? Wasn't there a man there that knew that I was the first blind teacher in the United States, organized the first institution, and have devoted more time to the improvement of apparatus for the blind than probably any other man in the United States? I suppose not, or humanity, I think, would have led him to make an effort in my behalf. * * * *

I hope to hear from you soon with particulars as to your proposed improvements.

With many thanks for your kind effort in my behalf, I remain

Very truly yours,
JOHN D. RUSS.

I also quote from the Criticism as follows:

(*e.*)

" In his 'Experiment No. XIII., November, 1869,' Dr. Russ shows a 'first experiment in embossing on both sides of the paper at the same time.' In this number, alluding to his two line dot alphabet for common spelling, he says:

"'This method, with slight alterations, having been since successfully experimented on in one, at least, of our institutions, is now exciting some attention in other countries, and the importance of the axiom which we first illustrated, *that alphabets for the blind should be so constructed as to give to the most frequently recurring letters the fewest marks and the smallest spaces, is beginning to be acknowledged.* We are particularly gratified that it has fallen to the lot of the New York Institution, our own nursling, first to perceive the advantage of this method, and to inaugurate and develop our plans, and push them with such vigor and directness.'"

(*f.*)

" The Russ system, with some modifications, was adopted by Mr. Wait without the slightest acknowledgment of its authorship, published in the New York Report in 1868, and brought before the Indianapolis Convention in 1871."

Before considering these matters in detail, I desire to make a general statement.

In October, 1859, I became a teacher in the New York Institution for the Blind, which position I retained for two years, first under the superintendence of Mr. T. Colden Cooper, and later under that of Mr. Robert G. Rankin. My classes were of the senior and sub-senior grades. I devoted much time to extra instruction and became perfectly familiar with the entire range of school work.

In October, 1863, I was appointed Superintendent, which office I have held since that time.

During the two years of my teaching, the name of Dr. Russ was not mentioned to me or in my hearing by either Mr. Cooper or Mr. Rankin, or by any teacher or pupil, in connection with a point system or with any other matter relating to the work.

After I had fairly settled into my work in 1863, the subject of reading, writing and embossed books quickly engrossed my attention. An inquiry by correspondence and personal visitation revealed the fact that one-third of all the pupils attending the principal schools in the United States were unable to read, and that tangible writing and the use of text books were almost unknown. This state of facts and the existence of many different styles of embossed letters indicated a defect somewhere.

Investigation and experiment showed that in a majority of cases the Roman forms of capital and small letters, which had been so generally adopted, did not lie within the power of the sense of touch, nor could they be used in writing.

At the same time it was also demonstrated that the plan of forming the signs of dots, originally suggested by Barbier, was the correct one. Yet this plan, suggested in 1825 and soon after improved by Braille, was in 1863 but little known or used outside of the Paris school. Having by ample experiment first proved the superiority of dots over lines in tangible power, and seeing also that hand writing could be done in tangible form by their use, I became an earnest advocate of "points" as constituting the natural basis of tangible writing and printing.

An inquiry was then instituted to learn whether the Barbier-Braille plan was the best that could be devised. This naturally led to the further question, shall the method of combining the points be alphabetic, phonetic, or stenographic?

It has long been well known to those acquainted with the art of printing that some sounds and letters occur very often, while others are used only rarely, and I quickly perceived that it might be utilized in forming a punctographic alphabet.

In applying this fact to the formation of signs in the vertical, or Barbier, rectangle it was seen that no reduction in space was secured, inasmuch as the area assigned to all letters is the same, being as great for a sign of one point as for one of six points.

This led to the adoption of a series of base forms, having two points vertically, and one, two, three, four or more horizontally. Thus : :: ::: ::::

To these were assigned the letters and sounds in the order of their recurrence.

After much tedious labor and careful investigation I arranged a series of capital and small letters, with numerals, punctuation marks, and ten word and part word signs.

After due consideration of the physiological questions involved the scheme was brought to the point of readiness for a practical test on a large scale. I prepared a primer of twelve pages, and, acting as typesetter and printer, struck off enough copies to put into the hands of all the pupils, with the result that in eleven lessons of an hour each the primer had been satisfactorily mastered by the entire school, including pupils who, after years of effort, had failed to read the *line* letters.

These inquiries and tests covered a period of years, during which the subject was frankly and fully discussed in my reports. In 1871 I presented the matter before the convention of educators of the blind held at Indianapolis.

My work, as here briefly outlined, was wholly independent of Dr. Russ, for I had no acquaintance with him or knowledge of his publications; and no information or apparatus derived from him was ever to my knowledge or by my direction used in working out and practically applying the code of symbols, either literary or musical, which I originally designated as "The New York Point System."

The assertion by Dr. Russ in his letter that the rule or guide for writing which was in use at the Institution in October, 1878, was introduced by him, and left at the Institution before I became Superintendent, is not correct. I had never seen or heard of any guide or rule for writing made by Dr. Russ. So far as I know, the first model of a rule or guide for application in writing the "New York Point" was made by Mr. Stephen Babcock, and the first demonstration of the practicability of *writing* the points in the horizontal order required by the system was made with this guide. All New York guides used in the school in October, 1878, and prior thereto and down to this time, so far as I have any knowledge, have been made with punches and dies, constructed under my own direction, on the basis of the model made by Mr. Babcock. Furthermore, there is evidence that as late as 1871 Dr. Russ did not know the requirements of a workable guide.

Writing in 1873, Dr. T. R. Armitage said: "I wrote to Dr. Russ, from whom I derived my information respecting the New York system (before I had seen Mr. Wait's report), for a frame, and *failing to obtain one from him*, wrote to Mr. Wait. Then another member of the Association wrote to Mr. Wait. The following is a copy of the questions contained in that letter (dated 8th July, 1869):

"'The points on which we desire information now are: 1st. What is the writing frame, (with a specimen if possible)? 2d. Specimens of both writing and printing? 3d. What is the plan of

musical notation with a complete musical alphabet attached? 4th. Why are the numbers in the New York system made to vary from those in the Braille?' * * * We, however, could obtain neither frame, drawing or precise information from Mr. Wait, and *more than a year elapsed before I got a rough drawing of the frame from Dr. Russ*, which exhibited apertures in the guide *three points long* and two deep, with one-sixteenth inch interval between the points."

It will be observed that Dr. Armitage says that before having seen my report he had derived his information regarding the New York System from Dr. Russ, who has been put forward as having "invented" that system several years prior to 1869.

One would suppose that the author of a system, and especially a philanthropist, would have furnished in "precise" form all the information related to the subject. Yet the letter of July 8th, 1869, says: "The points on which *we desire information now are*," etc.:

It was impossible for me to reply definitely to these explicit questions from the fact that I was at work upon the Musical Notation, and there were also some practical questions which had yet to be settled in respect to both writing and printing.

More than a year elapsed before Dr. Russ replied, and then the description which he gave of the New York guide shows that it was unlike any guide in use here, both in *scale* and *structure*. I have no knowledge that any such writing apparatus was ever in use anywhere, and believe it to be impracticable. Such being the character of the guide indicated by Dr. Russ in 1870, is it reasonable to suppose that his knowledge of the subject was any better in 1863?

The quotation from Dr. Armitage is significant beyond showing the relations of Dr. Russ in the matter. The reader has doubtless observed its censorious tone, and the intimation that as no "precise" information was received from me, Dr. Armitage and those acting with him were without information, except as it had been received from Dr. Russ. A brief reference to the facts is therefore appropriate.

The report of the New York Institution for 1868 did not go to press until after February 6th, 1869. As soon as it was ready I sent a copy of it to Dr. Armitage and to Mr. C. H. Munley, and advised them of so doing by letter April 17th, 1869, which was acknowledged by the letter of July 8th referred to above, and by which I was advised (after the lapse of nearly three months) that the reports had not come to hand. This letter also states that its writer had procured a copy of the report of 1868 from Dr. Armitage, who in turn had received it from Mr. J. H. McHenry, of Baltimore, some time prior to May 28th, 1869. This report contained an article, "Alphabets and Books for the Blind," which presented an illustration of the proposed New York alphabet, our Lord's Prayer in the same, together with statistics and all the important information then at hand. No writing tablet had as yet been made, and hence I could not speak of this and other practical and mechanical matters, which could only be determined by experiment.

Thus it will be seen that although the reports sent by me were not received, still the report, with all its information and guiding suggestions, was in possession of Dr. Armitage.

With the letter of July 8th, 1869, I also received an embossed hand-written specimen of the New York alphabet and ten contractions on a scale of one-eighth (which is too large), and bearing this indorsement: "With a frame and style made for Mr. Littledale on a countersunk metal surface." With the same letter came also the following inclosure:

"Mr. Littledale's comparative table of the Lord's Prayer. Comparison of the Lord's Prayer in three systems:

	Braille.	*New York.*	*Moon.*
Lineal measure	117 in.	111	111.5
Square measure	62.5	45	51
Number of characters	283	248	272
Number of points	831	609	

Proportion per cent. in	*Braille.*	*New York.*
Lineal measure	100	94.8
Square measure	100	72
Number of characters	100	84.09
Number of points	100	73.2

"Mr. Littledale also thinks it pleasanter to *feel* a double than a triple row of points, and that with practice the former may be read more quickly.

"*Cheltenham, June*, 1869."

This shows that the information and suggestions contained in the report of 1868 were quite sufficient as a basis of experiment. It should be observed that as the scale of one-eighth is far too large the results of the comparison did not correctly represent the New York System. It is at least one-third larger than any scale ever used for writing in the New York School. So far as I know the conclusions of the "Executive Council" were based on this egregious one-eighth scale. It is a good illustration of the manner in which that body reaches an impartial decision upon evidence of its own making or choosing.

On February 8th, 1870, as soon as the "Point Primer" was ready, I sent three copies to Mr. Littledale, who was one of the six members of the Executive Council of the British and Foreign Association. This was several months before Dr. Russ sent his faulty description of a guide, which Dr. Armitage acknowledges, while he fails to recognize the courtesy extended either by Mr. McHenry or myself.

Further comment on the passage is needless.

To return to our subject: "It is a very singular fact, if he invented it, that the two inventions should run in the same groove *exactly.*" (Dr. Russ.)

As I have stated, my work was wholly independent of anything Dr. Russ had ever done. Dr. Russ himself says that the principle that alphabets for the blind should be so constructed as to give to the most frequently recurring letters the fewest marks and the smallest spaces is an *axiom.* Surely any other intelligent observer, under favorable conditions, might be expected to recognize a self-evident truth.

The nature of the subject is such that a dozen persons, pursuing an inquiry regarding it, and duly considering what it was desirable to accomplish, would have observed the same facts, resorted to similar means, and would have been confined to a common and restricted channel of endeavor.

To illustrate: In horizontal structure forty-eight signs can be found within the limits of the three forms.

The entire set of forty-eight signs would be exactly the same in the hands of any number of different persons, and the resulting schemes would doubtless present more or less correspondence. This, however, would not show one to be a derivative from another.

The last quotation shows that Dr. Russ understood this. The intimation that the two inventions run in the same grooves *exactly* is contradicted not only by what has already been shown in regard to the *rule* or guide, and further, also by the admission that they did *not* run in the same groove *exactly;* for, speaking of certain signs used in the New York system, Dr. Russ says, "*it was only the experience of Mr. Wait with his pupils which led me to adopt them.*" Thus it appears that Dr. Russ did not hesitate to appropriate the results of my experience. This alone, it would seem, should have deterred him from the testiness which marks his letter. Under the security of a privileged communication, however, he may have felt at liberty to indulge in self-laudation and in censorious comments based on *ex parte* statements. But doubtless he would have refrained had he suspected that through a breach of the respect due to him, and to a private communication, his letter would be passed over to a third party, to be used in the attempt to cast reproach upon another, under a fulsome pretence of presenting his claims, nearly thirteen years after the letter referred to had been written.

Dr. Russ says, "I am always ready to give Mr. Wait all the credit due him for his slight modification of my alphabet and for his efforts to place it before the blind ; but I cannot afford to allow, and I should suppose that Mr. Wait's *self-respect* would prevent his *claiming*, an invention which so demonstrably and unquestionably belongs to me." Here he is quite right. It never occurred to me that there was any occasion to either claim or disclaim. I simply performed my work according to my own purpose and methods, with the valuable aid of earnest teachers here, and of co-workers elsewhere, and submitted the results to general scrutiny, when capable and fair-minded men readily distinguished them from other productions in the same field. I called the literary and music codes "The New York System," but by common custom from the first my name has been applied to it, although I had expressed my wish that this should not be done.

Although the incessant labor of investigating, planning and executing involved in this work was not within the line of obligatory service, still the incentives, opportunities and the facilities for doing the work were found *here in the New York Institution*, so that propriety, not less than good policy, required an abnegation of personality.

It is worthy of notice that Dr. Russ had not been connected with this Institution since February, 1835. I am informed that for many years, and during the time he was issuing his leaflets, he resided at Pompton, N. J. Such being the case, one would suppose that he would have dated his leaflets at Pompton. But in the article claiming that he founded this Institution it is stated that some of the leaflets were dated "New York." If the Institution had been located in New Jersey would these leaflets have been dated at New York ?

Dr. Russ says, "I am surprised that Mr. Wait should be so afraid of the mention of my name," etc., etc. "What have I done, that my name should so unceremoniously be kicked out of the Convention ? Wasn't there a man there that knew that I was the first blind teacher in the United States, organized the first institution, and have devoted more time to the improvement of apparatus for the blind than probably any other man in the United States ?" To the last question Dr. Russ gives sufficient answer when he says, "I suppose not." The situation referred to in the first question in exaggerated terms was entirely due to those who acted for him.

Several months prior to the meeting of 1878 the Executive Committee, at the instance of the writer and by his hand, extended an invitation for some one connected with the Boston School to prepare a paper on the subject of embossed literature. The invitation was accepted. Courtesy should have prompted the writer of the paper to hand it in to the Executive Committee prior to the meeting of the Association. This was not done ; but at one of the sessions, from which I was at the time absent attending to Committee business, an attempt was made to introduce and read the paper, in avoidance of the rule by which all papers were referred to the Executive Committee, who acted as a business committee and arranged the proceedings of the several sessions.

The urgent effort to avoid the usual reference to the Committee was significant, and it was properly sent to the Committee, who after due deliberation decided that a part of the paper was objectionable and should not be read. The members of the Committee were M. Anagnos, Mrs. S. C. Little, W. D. Williams, F. D. Morrison and myself, but from a sense of propriety I did not act with the Committee in this matter. So much of the paper as properly related to the subject was cheerfully accorded a hearing and was read. Later, an effort was made in the Convention to secure the printing of the paper as a *whole*, but it did not succeed.

Why, then, did the Committee and the Convention take this action ?

First. Because the paper as presented was foreign to the purpose of the Association ; it was not within the purview of the invitation, and was a breach of the privilege and courtesy which had been extended at my own suggestion.

Second. Because personal claims or questions of a personal kind ought not to be presented or considered at the meetings of the American Association of Instructors of the Blind.

I may here remark that great difficulty has been experienced in collecting the funds for publishing the proceedings of the Association, some institutions declining to pay therefor. When the Association shall allow matter of this character to be insinuated into papers prepared for its consideration, or shall assume the publication of it, this difficulty will probably become insuperable. Dr. Russ might have published this matter at his own expense. This he did not do, from which it appears that he did not deem it of enough importance to publish, unless the expense could be saddled upon the Association.

There is also a well settled principle which the members of the Convention could not fail to recognize. I had been writing freely upon this subject for some twelve years, in my reports, and at the meeting of 1871 and thereafter had explained and advocated the New York Point System. Yet it was not until 1878 that this effort was made to put Dr. Russ forward as the author of this system. And then the claim was made by proxy, not squarely, but surreptitiously under cover of the invitation. The plan was an after-thought. Dr. Russ was resorted to simply as a foil, as the means to an end. And if successfully, what then? Would any system under his name have been adopted by the parties with whom he acted, and to whom he intrusted his case? Not at all. The work for which they crowned him to-day would have been rejected to-morrow. Evidence of this is furnished by the letter of Dr. Russ, which also shows that he had been kept in ignorance of the real purpose and methods of the Columbus movement.

Dr. Russ says in his letter, under date of October 27th, 1878:

"*I am rejoiced to learn that you are making efforts to introduce the recurrent principle,*" etc. This jubilant expression betrays surprise, and was evidently not made about a matter then resting within his own purpose, or of which he had been long cognizant. It was spontaneous, and was clearly evoked by information evidently conveyed for the first time to him in Mr. Smith's letter of September 23d, 1878.

The Columbus Convention was held only a few weeks before, on August 21st to 23d, and a glance at the paper then read by Mr. Smith will show that it must have been in course of preparation for a long time prior to that date. In that paper there was set forth a new scheme in vertical style, based upon the "recurrent principle," of which Dr. Russ is set forth as having been not only the first, but the *sole* discoverer. Yet of *this* part of the plan Dr. Russ was kept in ignorance.

"Try what you can make of it," says Dr. Russ, quite unsuspicious of the fact that his proxy and champion had already been for months trying to see what he could make of it, and yet withholding the "particulars" of which Dr. Russ, in the closing paragraph, expresses the hope that he may soon learn.

How completely the personality of Mr. Smith pervaded this paper, and how absolutely Dr. Russ was ignored, is shown by the fact that in it "I" and "my" in such expressions as "I find," "I think," and the like occur more than fifty times, while the name of Dr. Russ appears only once, and then in a foot-note to a table, thus, "calculated from a table furnished by Dr. John D. Russ." His name was not to be connected with the "New Braille" System, but was to be conspicuously associated with the New York System, and with that sop he was to be satisfied. This done, the New York System was to be supplanted by the New Modified Braille. And then? Dr. Russ and the New York System were to be quietly laid away, with appropriate ceremonies.

Referring to the impropriety of raising this issue, Mr. J. Howard Hunter, Principal of the Ontario Institute, wrote as follows: "In his report for 1871 Mr. William Wait, Superintendent of the New York Institution, published the system that generally goes by his name, though I believe Dr. Russ, a former superintendent of that institution, claims the invention as his. No matter who the inventor, Mr. Wait is clearly entitled to the credit of usefully applying the system and fashioning it into a generally available and powerful instrument of knowledge. For my part, I confess, I am more interested in George Stephenson's locomotive than in the steam whirligig of Hero, the Alexandrian. It is to my mind extremely disingenuous, after Mr. Wait has had to bear the whole stress of criticism for seven years, and has during that period been the recognized lawgiver of the system, to now raise mere antiquarian questions. In my report for 1875 I compared in detail the Wait and Braille point alphabets. Only the result need here be stated, that Mr. Wait's alphabet is now generally admitted to possess the following points of superiority: (1) The letters of most frequent occurrence are represented by the fewest points; (2) In consequence of the points being only *two* deep (instead of three, as in the French alphabet) the reader's finger requires for their recognition a simple horizontal movement, instead of a horizontal and a vertical movement; (3) The area required for the expression of a given quantity of 'copy' is materially less than in the Braille system." (See Report, September 30, 1878, p. 375).

I quote again from the Criticism: "As the founder and first superintendent of the New York Institution, as the originator of the horizontal recurrent alphabet, and as a benefactor whose name has been banished beyond the knowledge of those who would honor his memory, dishonorably suppressed and trodden under foot by those whose less unselfish labors his generous work reproves, is it not a tardy act of justice to make some fitting recognition of his services, at least to connect his name with his method of embossed point and call it henceforth the *Russ Point System?*"

It appears from evidence supplied by the Criticism, and by Dr. Russ in his letter, that at intervals from as early as 1862 down to 1869 he had distributed to the several institutions in the United States several papers published by himself, setting forth his views. His repeated offers of rewards, made to stimulate interest, were also widely circulated.

These facts prove that any such banishment and suppression were impossible.

Since the year 1863 I had known Dr. Howe, of Massachusetts; Mr. Wm. Chapin, of Pennsylvania; Mr. W. H. Churchman (blind), of Indiana; Dr. A. D. Lord, of Ohio; Mr. J. W. Sturtevant (blind), of Tennessee; Mr. W. D. Williams, of Georgia; Mr. F. D. Morrison, of Maryland, and Rev. P. Lane (blind), of Louisiana.

All of these gentlemen were superintendents of institutions for the blind. Dr. Howe antedated Dr. Russ in connection with the work, and Mr. Lane was one of the first six pupils of the New York

School in 1832. The subject of embossed literature, and indeed of every related topic, was often referred to in conversations and correspondence, but neither the name nor the work of Dr. Russ was to my recollection ever mentioned by either of these gentlemen, either in conversation or correspondence.

Of course I have not time in which to examine the reports of all the institutions covering a period of years, but having read them as they have appeared from time to time since 1863, I hazard little in saying that no reference has been made to Dr. Russ in any of them. If such mention were required, either as a matter of courtesy, justice or duty, the obligation rested upon all, but more heavily upon the older men in the profession. Such suppression was impossible, and a general ignoring of the name or achievements of Dr. Russ could have been effected only by a general agreement, to suppose which is preposterous.

In the forty-first report of the Boston Institution Dr. Howe published an article on printing for the blind. This was in 1872, ten years after Dr. Russ began to distribute his papers, and yet no reference to him was made in that article. Did Dr. Howe "dishonorably suppress" and "trample under foot" the name of Dr. Russ?

In a letter written by Mr. P. Lane to the American Association of Instructors of the Blind, at their meeting in Boston in 1872, he says: "I thankfully acknowledge the service rendered by Mr. Wait through his system of tangible point writing. For private convenience and easy availability this system is superior to any other known to me." (See Appendix of Proceedings of Boston Convention.)

In December, 1871, Mr. Wm. Chapin, of the Pennsylvania School, wrote as follows:

"From the inconvenience and large expenditure arising from the diversity of different systems of printing in Great Britain the managers and educators of the blind in this country have inclined to adopt, as nearly as practicable, a uniform alphabetical line system for the general literature of the blind; and also a dot system (a modification of Braille's, as introduced by Mr. Wait, of New York) for writing and other purposes." (See 39th Pennsylvania Report.)

In December, 1874, Mr. Chapin again wrote:

"The point system of Braille, extensively used in Europe, and the New York system by Mr. W. B. Wait, an ingenious modification of Braille's, have the undoubted merit of being easily distinguished by the touch." (See 42d Pennsylvania Report.)

The statements here cited were made by men eminent for knowledge and good works, and who had grown old in the service, while as yet I was only a novice. Did they then "dishonorably suppress" the name of Dr. Russ? Other citations of similar import might be made, but these will suffice.

The statement quoted (*f*) has already been fully answered. I neither adopted, modified, published or brought out any Russ system.

The disingenuous character of much else contained in this Criticism might be shown, did time permit. Turning to a more important subject, a brief space will now be devoted to the consideration of tangible codes. In the discussion details will be avoided as much as possible.

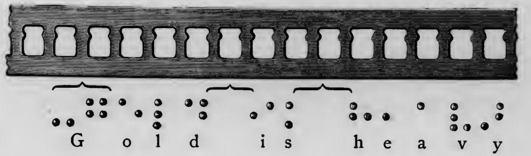
And first, of the matter of space. It is not claimed that the vertical style ⠿ is more economical than the horizontal : :: ::: :::: Indeed, the advantage is conceded to be with the latter.

But in making out as good a case as possible for the Braille, what is called a uniform scale has been assumed, viz.: "Having the points which compose the characters of the same size in both systems, the space which separates these points the same, and the spaces between letters, between words and between lines the same in both."

The diagrams 1 and 2 represent a "New York" and a "Braille" guide, with the words "Gold is heavy," as they would appear when written in each guide. The *word spaces* are shown at the braces, and the relative areas, expressed by the number of points included in the *word spaces*, are clearly indicated.

The New York guide, as shown in the cut, does not give the minimum practicable scale, but it is used here because it is the one generally known.

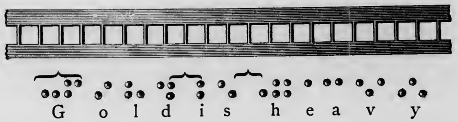
No. 1. Braille.



Actual area needed for letters, letter spaces and word spaces expressed in number of points:

Length	41	points.
Depth	3	"
Total	123	"

No. 2. New York.

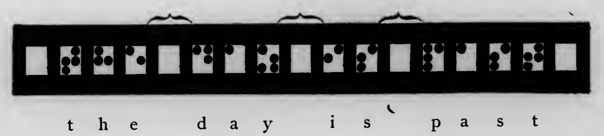


Length	37 points.
Depth	2 "
Total	74 "

Excess of Braille, 66+ per cent.

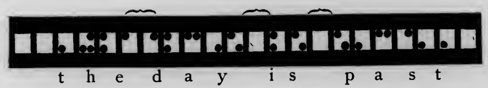
In the following sentence, "the day is past," the words are shown in the guide:

No. 3. Braille.



Length	44 points.
Depth	3 "
Total	132 "

No. 4. New York.



Length	37 points.
Depth	2 "
Total	74 "

Excess of Braille, 78+ per cent.

The area of Braille word space is 3x4=12 points.
The area of New York word space is 2x2= 4 "

Excess of Braille, 8 points, or 200 per cent., whereas they were assumed to be equal. The value of the error, as carried into Mr. J. W. Smith's calculations, based upon "copy" containing 50,038 letters, may be approximately fixed. He does not give the number of words in this "copy," but it can be determined with sufficient accuracy for our purpose.

An examination of the vocabulary used in "Little Women" shows an average of five letters to a word, which for 50,038 letters gives 10,007 words and a number of word spaces approximately the same, or 10,007 word spaces. Error on each
8 points.

80,056 points.

This does not include the space between lines, but only the space included within the vertical limits of letters. If the line space be included with the area of the word space the result is as follows:

Area of word and line space in Braille,	4x4=16 points.
Area of word and line space in New York,	2x3= 6 "
Difference	10 "
Number of word spaces	10,007
Error in each	10 points.
Total	100,070 "

In the Criticism it is said "that his statement that the Braille 'requires' a word space of 'not *less* than four points in writing' is disproved by the Boston tablets, in which the word space is less than three points."

In a New York guide 8½ inches ($\frac{100}{12}$) long, 100 points are made; that is, 1 point to each $\frac{1}{12}$ inch. If the reader will apply a rule with $\frac{1}{12}$ scale to cut No. 1, on page 19, which is a *fac simile* of a Boston tablet recently procured, it will be seen that the cells are approximately $\frac{2}{12}$ and the vertical bars $\frac{1}{12}$.

In practice the points *in* the cell are a trifle closer than the nearest points of two adjacent cells, but the *average* distance is $\frac{1}{12}$. Thus in a Boston guide, the openings covering 7 inches in length, or $\frac{84}{12}$, give 27 cells with 54 points and 26 bars with 26 points, making 80 points in $\frac{84}{12}$ inches, which is a fraction coarser than a $\frac{1}{12}$ scale. Although the difference is slight, it aids in showing the fallacy of the "uniform scale" theory. For the present purpose the scale will be considered as $\frac{1}{12}$. Hence it appears that each $\frac{1}{12}$ inch represents 1 point.

Applying a $\frac{1}{12}$ scale to cut No. 1 the word space at the first brace has $\frac{4}{12}$, that at the second has $\frac{5}{12}$. Can there be any doubt that a vertical code requires a word space of not less than 4 points lengthwise?

The theory on which it is deemed proper to allege that the word space "is less than 3 points" is interesting as exhibiting that fertility of disingenuous resources with which we have become familiar.

For each letter in a word there is a letter space separating it from the adjacent letter. Now if it be assumed that the *terminal* letter of a word also has its *letter* space of 1 point, and that it is not merged into or regarded as being *word* space, then the word space can be construed as having 3 points instead of 4. And inasmuch as the space under the bar between the adjacent points of two letters is a trifle greater than the distance between the points *in* the cell, it may be said that the word space is *less* than 3 points.

It is well known that the New York word space is reckoned as 2 points, and this was assumed under the fallacious "uniform scale" as being also the Braille word space.

If, however, the terminal letter of each word is to be accorded a *letter* space, then the terminal letters in the New York code should be treated in like manner. Hence, on this basis, the New York word space should be reckoned as 1 point instead of 2. The relations of the word space would then be, 1 point in New York to 3 in Braille, instead of 2 to 4.

Starting with this fallacy of a terminal letter space, we end with this absurdity, viz., that the New York letter space is 1 point, and the word space 1 point.

There can be but one correct view of the matter, which is, that the whole space between words is word space, and hence the word space in a vertical code cannot be less than four points in length.

Granting for the moment that the line space is the same vertically in both systems, it will be seen by the cuts that it is not the same horizontally, but that at every word space the corresponding line space differs. That is, the line space must be as much greater in length in Braille as the word spaces are greater.

This specious assumption of a "uniform scale" disregards the element of *horizontal* difference in *word* space, and in the corresponding part of *line* space, and assumes that the only difference is in the vertical dimensions of the letters.

In point of fact, however, the line space vertically may be less in the New York System than in Braille, for the upper and lower parts of different letters should not be much closer together than different parts of one and the same letter. The greater the vertical length of the letters the greater must be the line space vertically, when only one side of the paper is used. It is this fact which renders "interlining" so essential in a vertical code. It is equally practicable for the New York System; but the small gain which it might secure would hardly compensate for the inability to varnish the manuscript, which cannot be done when the paper is embossed on both sides, and which is of great value in preserving embossed writings.

A resort to this faulty assumption, and to the defective methods based thereon, was doubtless due in the first instance to misapprehension; for otherwise it would indicate not merely consciousness of a weak case, but a willingness to adopt factitious methods in the expectation that under cover of plausibility and high sanction they would be accepted without question.

The fallacy of a uniform scale, which consists in assuming an equality where no such equality exists, was first adopted by Dr. T. R. Armitage and the Executive Council of the British and Foreign Association, and although it was pointed out some twenty years ago, it was adopted by Mr. Smith in 1878 as the foundation of his argument made at that time. That the same faulty argument should have been restated in 1891 is, however, not surprising, for it is a strong prop in a weak case. But the error may be shown in another way.

Having found the number of points in length required in writing "copy" equal to 50,038 letters, including the *word spaces*, Mr. Smith divides the whole number by 100, the number of points in a line, to find the number of lines. As we have seen, the 50,038 letters give about 10,007 word spaces.

Number of word spaces	10,007
Length of New York word space	2 points
Total length	20,014 "
Number of word spaces	10,007
Length of Braille word space	4 points
Total	40,028 "
Assumed length of word space	20,014 "
Discrepancy	20,014 points

20,014÷100=200 lines and over.

200 lines, 100 points long, and 4 points deep=80,000 points.

It will be understood that the number of word spaces in 50,038 letters will depend upon the number of words into which they are formed. Thus the number would be much greater in the Psalms than in Macauley's Essays. These are not the only errors involved in the fallacious "uniform scale," but further illustration is not required.

Another artifice which has been resorted to is the use of a larger number of contractions in writing out the chosen "copy" in Braille or Modified Braille than were allowed in connection with the New York code. In arriving at the results presented in his Columbus paper Mr. Smith used some 49 contractions in writing out the "copy" of 50,038 letters in Braille and only 10 in writing it out in the New York System.

The manifest unfairness of such a procedure and the delusive and worthless character of the results are both apparent. The extent of the undue advantage gained in this way is shown by the following lists:

Contractions accorded to Braille.					*Contractions accorded to New York.*
and	er	ing	self	to	and
but	ever	less	sh	under	ch
can	every	ment	shall	very	ing
ch	for	ness	sion	wh	of
com	from	not	st	which	ou
con	ful	of	th	will	sh
dis	gh	ong	that	was	th
down	have	ou	the	with	that
ed	his	ow	this	you	the
en	in	right	tion		wh

An attempt has been made to justify this course upon the hypothesis that each system should be used with what Mr. Smith calls "its own contractions," or "authorized" contractions.

Any short-hand devices for reducing the space required by the Braille code which anybody had suggested were "authorized" and became "its own." A simple statement of the case suffices to show the specious character of this contention and the worthlessness of any comparison made on such a basis.

In order to prevent further recourse to this style of argument, I have prepared with much care a list of more than 500 contractions—miscellaneous, musical and mathematical—derived from various practical and authentic sources, and which, in common with the first ten, as above noted, are authorized as a part of the New York System.

For the reasons adduced it appears that the Braille does not possess the degree of excellence claimed for it. Equality with the

New York System has never been claimed, much less superiority, even with the help of adventitious aids.

The other point on which stress has been laid is that of labor of writing. Here the claim is not made for the Braille, but for the "Modified" Braille, and the basis on which the alleged superiority rests will now be considered.

In the effort to substantiate this claim recourse was also had to the use of contractions in the manner before explained. It has been conceded that without contractions the New York System required 20 per cent. less time in writing a given amount of "copy" than the Braille; and, further, that when each was allowed "its own" contractions, 49 for Braille to 10 for New York (see list), the New York System was still in the lead by 1½ per cent.

In this latter case contractions were used 8,162 times for Braille, and are said to represent 21,120 letters out of the total 50,038. For the New York System contractions were used 4,026 times, and represented 10,218 letters.

The higher efficiency of the New York contractions is worthy of note. So great is it that if the list of 10 were increased by 10 others equally well chosen, they would about equal in effectiveness the 49 included in the Braille list.

We ought not to overlook the fact that contractions should be used very sparingly in all elementary works, which must always constitute a large proportion of embossed literature, and that their use should be consistent with euphony and correct orthography. In the construction of the New York System regard for these considerations restricted the number of contractions to 10, which were to have the same value as the letters, and to appear in all books. They occur so often that they are learned without difficulty in connection with the alphabet, and facilitate reading from the very start.

But the relative merit of any system can only be determined *primarily* on a pure alphabetic basis, as seen in the illustrations, and on which the views presented at Indianapolis in 1871 were founded. This presents a determinate standard, while the introduction of a variable and optional factor such as contraction, leads, as we have seen, to mistaken conclusions.

It now becomes clear why a larger list was employed on the Braille side and a restricted list on the New York side. The result of using the same list on both sides would have been disastrous. Even against these great odds the New York System is admitted to be preëminent.

The remaining means for reducing the labor of writing is secured by arranging the letters according to the principle of recurrence. While this is entirely legitimate, and, indeed, the only device which is at once logical and essential in the formation of a punctographic alphabet, still there is a limit to its application in the vertical rectangle of points ⠿ This limit is determined by the elements of unity and perspicuity in the structure of both *letters* and *words*. These two qualities depend upon three conditions:

First. That the position of the points, whether single or multiple, shall be such that they can be located readily and with certainty.

Second. Suitable proximity of the points whereby they may be readily construed as forming a single sign.

Third. That the spaces separating letters and words shall be of minimum and uniform extent in each case respectively.

The signs formed in a vertical rectangle of six points ⠿ may be classed as unilateral or as bilateral. A sign which occupies *both sides* of the cell is bilateral. A sign formed on *one* side only is unilateral. Several are shown below:

Bilaterals, b|⠣ c|⠚ d|⠙ Unilaterals, a|⠁ e|⠂ l|⠇

The vertical line is used to show the position of the points at the top, middle or bottom of the rectangle.

It will be seen that there are 14 possible unilateral positions, 7 on each side of the cell, as follows:

3 of 1 point ⠁| ⠂| ⠄|
3 of 2 points ⠃| ⠆| ⠅|
1 of 3 points ⠇|

and that the 7 on one side are exactly like the 7 on the other side. Standing as single signs, this slight difference of location is all that distinguishes them.

Were it possible to use all of these unilateral signs, giving 6 of 1, 6 of 2, and 2 of 3 points each, it is clear that it would effect some gain in labor of writing over any of the known forms of Braille. No space would be saved, however, and the MSS. would be straggling and ambiguous, imposing far more trouble and labor in reading than could be saved in the writing.

Braille utilizes only 4 of these unilateral positions, viz.:

a|⠁ b|⠃ k|⠅ l|⠇

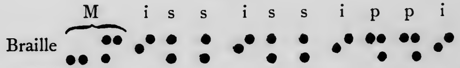
The modified Braille, as presented at Columbus, used 4 unilaterals, and on the principle of recurrence assigned them to

a e l t
|⠁ |⠂ |⠅ |⠃

This arrangement could not have been well considered, for, as we are informed, it "was changed almost immediately afterward—the changes being dictated by considerations of legibility in the combinations of letters." By this change, one more unilateral was introduced, the positions being a|⠁ e|⠂ l|⠇ s|⠅ t|⠃ What has been gained in legibility by the changes is not very clear.

The seeming brevity of these unilaterals is attractive, but their effect upon the compactness and unity of the words into which they enter is not favorable. This may be shown by a single example:

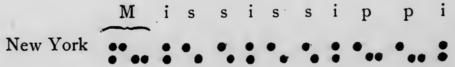
No. 5.



Length.................................. 35 points.
Depth.................................... 3 "
Area...................... 105 "

The disjointed character of this structure is in strong contrast with the unity and compactness of the New York System, as shown by the following illustration:

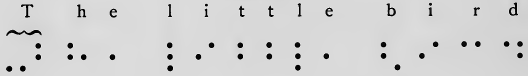
No. 6.



Length.................................. 32 points.
Depth.................................... 2 "
Area...................... 64 "
Excess of Braille, 64+ per cent.

The broken effect of this lack of continuity in word structure is seen in the following illustration. The waste of space resulting from the use of the unilaterals is also apparent:

No. 7.



The evident effect of the unilaterals is to disturb the uniformity of the letter spacing, thus dismembering the words and destroying that structural unity which must be regarded as an important feature of both words and letters.

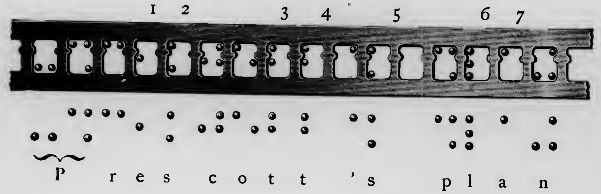
But with an ingenuity born of a determination to magnify any merit and extol every defect of the vertical codes, the Criticism says, "The unvarying space between the letters" (*i. e.*, in the New York System) "deprives the reader of the aid of the suggestion afforded by the irregular spaces between the characters of a Braille page."

That is to say, irregularity and disorder are more suggestive than regularity and order. But more than this, there is here an admission that at least the bilateral signs, when they occur in unbroken succession, are deficient in tangible power. The increased tangibility is not due to *irregular*, but to the *enlarged*, space itself, and hence if the letter spaces were made regularly larger the reader would have the aid of the suggestion afforded.

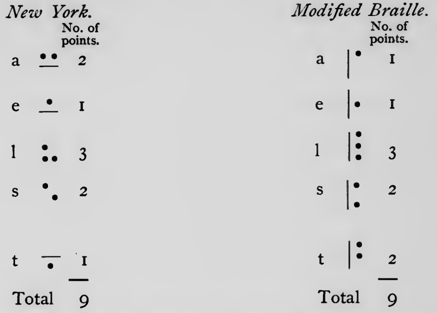
The obvious inference is, that in a succession of bilaterals, separated by the standard letter space, the tangibility is not as great as could be wished.

In the following brief example (only one of many) there are no less than seven "irregular" spacings.

No. 8.



As for the labor of writing, it will also be seen by the following comparison that the unilaterals are not more simple than the corresponding signs of the New York alphabet, and hence these five unilateral letters can give no appreciable gain over the same letters in the New York System:



New York.	No. of points.	*Modified Braille.*	No. of points.
a	2	a	1
e	1	e	1
l	3	l	3
s	2	s	2
t	1	t	2
Total	9	Total	9

As these five letters afford no gain in the labor of writing, it follows that any gain must be afforded by the remaining letters.

Seeing, however, that recourse to these five unilaterals of *simplest* structure gives *no gain* over the corresponding letters in the New York System, there is no reason to expect an advantage from the other letters. This view is sustained by a comparison of the alphabets when placed upon the same basis.

An examination of miscellaneous "copy" containing 30,828 letters showed that for practical purposes the recurrent power of each letter may be represented by the numbers in the subjoined table. Multiplying each of these numbers by the number of the points in the corresponding letters of each alphabet respectively, the aggregate on each side will represent the number of points required by each in a unit of alphabetic writing, which may be considered to be 520 letters, as distributed in the following table:

NEW YORK.				MODIFIED BRAILLE.			
Letters.	*Number of points.*	*Recurrence number.*	*Total points.*	*Letters.*	*Number of points.*	*Recurrence number.*	*Total points.*
a	2	40	80	a	1	40	40
b	4	7	28	b	3	7	21
c	3	12	36	c	3	12	36
d	3	20	60	d	3	20	60
e	1	60	60	e	1	60	60
f	3	12	36	f	3	12	36
g	4	10	40	g	4	10	40
h	5	30	150	h	3	30	90
i	2	40	80	i	2	40	80
j	4	3	12	j	5	3	15
k	4	3	12	k	4	3	12
l	3	20	60	l	3	20	60
m	3	12	36	m	3	12	36
n	2	40	80	n	3	40	120
o	2	40	80	o	2	40	80
p	3	10	30	p	3	10	30
q	4	3	12	q	5	3	15
r	3	30	90	r	2	30	60
s	2	40	80	s	2	40	80
t	1	45	45	t	2	45	90
u	3	12	36	u	3	12	36
v	3	7	21	v	4	7	28
w	3	10	30	w	4	10	40
x	5	3	15	x	5	3	15
y	3	10	30	y	3	10	30
z	5	1	5	z	5	1	5
		520	1,244			520	1,215

Difference in favor of Modified Braille, 29 points, in 1,244 points.

Thus it appears that there is no considerable saving of labor in pure alphabetic writing, and hence any material advantage can be secured only by the use of contractions; and, as has been shown, no valid claim can be made on this ground.

Punctuation marks as factors in the matter of space or of labor of writing are of subordinate importance.

An examination of a page of the "Forum," opened at random, gives the following:

Commas, 35; periods, 18; hyphens, 5; semi-colons, 4; quotation marks, 2; parentheses, 2; dash, 1. Total, 67.

A page has 40 lines, with about 60 letters to the line, giving 2,400 letters to the page (counting all the lines as full), or nearly 97½ per cent. for letters and 2½ per cent. for marks.

Doubtless passages might be found, and possibly whole books, in which the use of a particular mark would be far above the average, and in this way selections might be made to favor one code of marks or the other.

For example, the parenthesis is freely used in algebra, and very often as double, triple, and four fold.

In this instance the advantage would be decidedly with the New York mark. But whatever might be the advantage within the limits of algebraic writing it would prove nothing as to the use of marks in general literature.

It may be safely said that punctuation marks do not constitute more than 3 per cent. of the whole body of literary "copy" in general, and hence any advantage, either as to space or labor of writing, gained within this small fraction of the whole "copy" will at the most be trifling.

I have always contended, as I now do, that it is optional for the writer of the New York Code to omit the punctuations almost entirely, using blank spaces instead. The distinct and uniform spacing for letters and for words renders this feasible.

A glance at the Braille guide on page 19 will show that a punctuation *space* could not be smaller, and therefore must be as large or larger, than a word space, which is already of wasteful dimensions. This is impracticable, and so the Criticism objects to the use of spaces for punctuation.

At the same time they have brought about by the use of the unilaterals four kinds of spaces. Thus there is a true letter space (the bar) and a true word space (cell and two bars), which occur where each letter occupies both sides of the cell; but when a unilateral is used the unoccupied half of the cell is added to the true letter space, forming an irregular letter space of two points. When a unilateral occurs at the end of a word the unused space is thrown into the word space, making it so much larger than normal, and therefore irregular.

Surely, if two kinds of letter spaces and two kinds of word spaces will not destroy the unity or impair the structure and clearness of words and sentences, we may safely conclude that a space different from, and which cannot be mistaken for either a letter or for a word space, can be used in place of a punctuation mark, which the reader will supply according to the construction of the language.

The inconsistency of the objection to punctuation by means of free space instead of signs is further shown by the fact that those who object supply the place of the *bar* in music by a free space.

Brief reference ought also to be made to the subject of capitals. As is well known, capitals were not at first employed in embossed literature.

Referring to the exclusion of capitals from the Boston Code, Dr. S. G. Howe, its author, said: "I determined to use no capitals, because, first, it seemed unnecessary and unphilosophical to use fifty-two characters when twenty-six would suffice, merely to conform to a fashion of commencing sentences with a capital, a fashion which may change to-morrow; second, because it wasted precious space." (Dr. S. G. Howe, 41st Report Perkins Institution, 1872.) This view prevailed at Boston until about 1879.

From the first, and even at the time when Dr. Howe wrote the above, there had been little reason to expect that embossed books would ever exceed a small number of volumes, including the Bible and some selections from general literature. Instruction in literature and music was almost wholly oral, and there seemed little or no prospect that tangible text-books and stylography would ever assume the importance in our educational system which they have since attained.

More recently, however, our views of the methods and ends of education have taken a wider range; resources have increased, and facilities have multiplied. We have reached a stage in which the use of text-books has become not only possible, but necessary, in every grade.

Moreover, in order that our boys and girls may do their work as pupils, or afterwards as teachers, independently, and know the subjects as they are known to others, text-books must be printed in their full form and not as a mere epitome, or as synopses which it is the proper work of the pupil to make after studying the full text. In this view, capitals serve not merely the caprice of a literary fashion, but occupy a position of equal importance with other symbols, as signs for ideas and things.

A single example will suffice. In Peck's Manual of Algebra, now in course of publication, some 23 letters are used in both large or upper-case, and small or lower-case forms to represent quantities or relations.

Here the use of large letters is essential, and while the necessity is not always so imperative as in this case still if we would give to any subject in embossed form the same value in the hands of the blind which it has in the usual ink-print form we must reproduce the subject in its entirety.

In the New York System the capitals are formed from the small letters by a process of enlargement. They are of uniform size and *compact in structure*, which is an essential characteristic of capital letters.

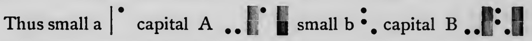
The rule for their construction is simple. To each of the small letters enough points are added to form a sign four points long.

If the last point of the small letter is in the upper row the points are added in the *lower* row. If the small letter ends with a point in the lower row, or with a point in each row, then the points are added in the *upper* row.

Thus: Small a ˙˙ large A ˙˙.. small c ˙˙. large C ˙˙.˙ small d ˙: large D ˙:˙˙

In the vertical plan it is evident that no capital can be made in a single cell that will differ in size or area from the small letters. Further, the vertical cell or rectangle of six points ⠿ admits only 63 combinations in all, 52 of which would be required by a double alphabet, leaving only 11 which would not supply the punctuation marks. In this way the *single* cell signs would be exhausted, and there could be no further extension without resort to *compounding*. The compound sign would consist of two capitals, two small letters, or of two punctuation marks, or of the union of one species with another, any of which would be cumbersome and practically useless.

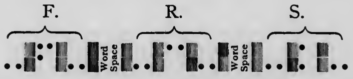
To avoid this difficulty a single form has been chosen which prefixed to a letter shows that it is to be used as a capital.



The space required for these capitals is 18 points as against 10 points for the New York capitals.

Again, the capital prefix of the Modified Braille is the same as the sign for the period.

Thus in the full and correct form F. R. S. would appear as follows:



To obviate the diffuseness of this writing, which however awkward has the merit of being correct, it is prescribed that "the word space may be omitted; the period which follows the first letter becomes the prefix or capital sign, for the next."

But in no proper sense can this double significance exist, for if the sign is a period, then there is no capital. If it is a capital prefix, then there is no period. These are two distinct signs, and as both appear in the original example both should appear in the embossed equivalent.

This is a good illustration of the narrowness of the basis of construction afforded by the vertical rectangle of 6 points. Still more clearly will this be seen from a very important consideration connected with *printing*.

It must be evident to the most casual observer that at best the number of tangible symbols at our disposal is very meager. Compared with the rich resources of ordinary typography, they are as nothing. For *writing*, too, the number is less than for *printing*, because in the former we may use *points* only, while in the latter we may enlarge the store of symbols by the use of *lines* and of combinations of *lines* and *points*. The number of these lineal signs or combinations must necessarily be small, and every one of them must be within the limit of *easy tangible* perception.

The power of types, by which both lines and points can be embossed, is far greater than the power of the *stylus*, which impresses points only.

Stylographic writing is of inestimable value, and every pupil should acquire the knowledge of it. Still, it is mainly a personal attainment, serving chiefly individual ends.

In orthography, grammar, technical correctness, speed and other features, stylographic writings will reflect the capacities of their authors, and such capacities differ widely in pupils of the same age and of the same grade.

Printed books, however, serve not only a personal but a universal use. While an average writer may in half an hour produce a page 8½ by 12 inches, and that with more or less imperfections, the printing press in the same time will impress hundreds of perfect pages, ready to the hand of any pupil in any school.

Moreover, while engaged in the act of writing out a given subject, especially from dictation, the pupil will learn little or nothing of it. It is only when the writing has been finished that the study of it can begin. If the matter were presented in printed form the time spent in writing would be saved.

The average number of words spoken by good readers when reading by sight is 160 per minute, or 800 words in five minutes. Only the most advanced and expert pupils, using a full list of abbreviations, could hope to reduce this amount of matter to writing in less than an hour. What, then, may be expected from the ordinary writers found in every class of a large school? But this is not all. In the time required to write a single page the pupil can compass several pages by reading, and a teacher reading while the class writes would give only five minutes out of sixty to this machine work, losing fifty-five minutes which might otherwise be devoted to teaching.

Thus it appears that writing should never be substituted for the printed book, either in literature or music, whenever the latter is available.

Much has been said, in the effort to raise a false issue, about "labor of writing." At the same time this laborious and wasteful method has been pursued while hundreds of pages of literary and musical matter have been left unused.

From the manifest importance of embossed *printing* it is clear that the *structure* of any system of tangible signs should accommodate itself readily to a combination with such simple *lineal* signs as will enrich our scanty store of symbols, and afford that *contrast in appearance* which not only renders the thought perspicuous, but which by condensing the expression reduces the bulk and cost of books.

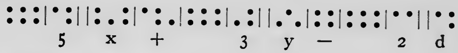
In algebra, as we have seen, large and small letters are required, and it is also essential that literal and numeral quantities should be represented by distinct signs, first, because clearness is thus secured, and, second, to avoid the constant repetition of the prefix for number, and for the sign for "number ended," both of which must be used if numerals and literals are represented by the same signs.

Such a combination of *lineal* numerals with *point* literals has been readily made by utilizing the signs:

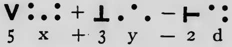
T	⊢	⊥	⊣	V	>	Λ	<	L	□
1	2	3	4	5	6	7	8	9	0

So also the signs for +, —, ÷, ×, ( ), etc., can be utilized. A single simple example will illustrate this point:

Suppose we have 5x + 3y — 2d. In written form this will be—

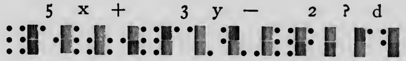


As printed it will be—



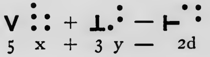
And here is brought out with striking force a peculiar advantage in the structure of the New York System. It consists in the fact that these line types will "*justify*" with the point types without loss of space.

The vertical or Barbier-Braille rectangle offers no such advantage. Taking the same example we have—



Inasmuch as the same sign stands for *d* and for 4, either a blank space must be left at ? or a sign for "number ended" must be employed to stop the effect of the number sign which stands before the 2; otherwise it would read 24, and not 2d.

If now we use lineal numerals, like those shown in combination with the New York Point types, it will be seen that they will not justify.



Here the space above the lineals is wasted.

The point brought out holds good not only throughout the whole series of mathematical works, but in Harmony, Physics, Acoustics, Chemistry, and in short in every subject where similar combinations are employed in ordinary typography for the expression of ideas or things.

No adequate provision has been made for reproducing mathematical works in the Barbier-Braille mode.

In 1867 Mr. Henry Robyn, whose efforts should be gratefully remembered, suggested some algebraic symbols, but the list was incomplete, and no indications for their application were given.

In 1889 the "Association Valentine Hauy" published a list, but it was less complete than Mr. Robyn's list, and as it stands is practically useless.

The subject seems also to have passed unnoticed by the British and Foreign Association, and has not been made a part of the Modified Braille.

And yet mathematics presents a most inviting field to the blind, one, indeed, in which blind men have attained great preëminence and won high distinction.

Some other erroneous statements of the Criticism require brief notice. Speaking of the New York Code, it says: "The apostrophe or hyphen is not used, and the absence of these marks, besides fostering incorrect habits in writing, must sometimes occasion ambiguity."

The fact is that both of these marks were in the Code as it appeared in the Report of 1881–2, having been *first* published in 1872. Whether these signs are always used in practice or not does not alter the fact that they appeared as part of the system.

Again, it is said of Dr. Russ that "he introduced the idea of embossing on both sides of the paper." This, in embossed printing, is known as "interlining."

Embossing both sides of the same sheet was first done as early as 1837, by Mr. James Gall, of Edinburgh, to whom the revival of

the art of printing for the blind is due, and who published the first embossed book for the blind in English in 1827.

Of interlining it was said: "Formerly it was impossible to print on both sides of the paper. Now, however, by means of the fretted types, the paper may be printed on both sides." (See "Account of Recent Discoveries for Facilitating the Education of the Blind," published by James Gall, Edinburgh, 1837.)

Of contractions in the New York System the Criticism says: "Its construction, admitting only 39 different characters within the space of six points, restricts the use of contractions to very narrow limits."

There are 48 combinations within the space of 6 points. Further, the New York System is not restricted to signs of 6 points, but includes ⠛⠛ and ⠛⠛⠃

Again, the use of contractions is in nowise limited in the manner stated, as the merest tyro in the subject must know.

Some advantage has been claimed for the vertical over the horizontal style in "facility of correction," and this matter may be briefly noticed.

In the first place, where movable types are used corrections can be made as readily in one system as another.

If in the course of writing in the New York System an error is detected at the time it is made it can be corrected if it is deemed worth while; but is far easier and involves hardly any loss of time to "fill up," that is, to make enough points to render the error nugatory, and then go on. In a vertical cell this cannot be done, for every sign made in a cell stands for *something*, and hence an error cannot be obliterated in this way, as in the New York System.

To illustrate: Suppose a class to be writing in the New York System. If a pupil makes a conscious error he "fills up" and goes on. In the Braille System he must either let the error stand or change it to some other more extraneous sign, or else remove the paper from the tablet, and at considerable loss of time erase the points and replace the paper. In the latter case either the class must wait or else he must lose so much as the others have written while the correction was being made, and this would be a greater evil than the error itself.

But it may be said that while this may be true of personal manuscripts and those which serve a temporary use, it will not cover the case of sheets of thin brass, embossed with a stylus for permanent use as a stereotype plate, and which must not only be accurate, but free from blemishes made in course of correction. It is urged that in this case the advantage is with the vertical code for the reason that all letters or signs occupy the same fixed space, ⠿

hence any wrong combination of points can be effaced and a correct combination substituted.

It will be observed that the *only* correction which is comprehended in this claim is that of an error in *each sign or letter* singly.

The letters of the New York System are not all of the same length or area, the small letters forming three classes, with three letters in the first, nine in the second and fourteen in the third class. The capitals are of uniform length, viz., four points. In practice the writer observes the classification, which is a safeguard against error. When mistakes occur between letters of the same class or area, the correction is as easily made as in the vertical code, for in the same area one combination can be made as well as another.

Passing from the structure of *letters* to that of *words* and *sentences*, it will be seen that the correction of errors is as easy in one system as in the other.

Suppose, for example, a brass sheet to have been written full in each system, and it is found that some letters or words have been omitted from each. The pages being full there is no room for the insertion of either letters or words. In case of a superfluous letter the whole or part of the word may be pressed out and the word closed up, leaving a larger word space.

If there be a word too many it must either stand or else be pressed out, leaving in the vertical style a blank space, whereas in the New York style it may be either pressed out or obliterated by the addition of other points. Or again, suppose that the Braille writer in the course of a sentence omits the capital prefix, the space being full, there is no place for its insertion. Should the writer of algebra make a single parenthesis in place of a double one, omit the sign for "radical," "radical ended," "exponent," "exponent ended," or make any one of a hundred other mistakes, which is not seen until the brass page has been finished, it would as a rule be impossible to remedy the defect.

As to the printing of books, either for general or school use, by means of brass sheets punched by hand, it is inadequate and not in keeping with the spirit and facilities of our time. A hundred years ago the excellent Hauy, with one great impulse of philanthropy and wisdom, at a single bound attained the printing of embossed books by means of movable types and a printing press. To-day we have not only movable types, but the improved cylinder printing press, the electrotype, the tinplate stereotype, the point-writing tablet and the typewriting machine. With these at command the use of hand-stamped brass plates involves loss of time, labor and resources.

When thus broadly considered it appears that the claim of facility of correction loses its force.

A few words may be said in regard to the bulk of books in New York Point, as affected by the type used by the American Printing House for the Blind. At the start, there was no plant of type in hand for this style of work. It was of course desirable that the size of the type bodies, and the distribution of the points thereon, should conform to the nature and best possibilities of the system. This, however, could not be attained without the construction of an entire new font of type, an expensive matter, and the more so when the best results at the foundry and in the school depend upon knowledge to be gained by experience and observation. Funds were scarce, and to avoid expense the type was cast on the basis of the type (Dr. Howe's Roman letter) then in use at the printing house, and the expense of new molds and of new spaces was avoided.

But type alone will not suffice for a publishing house. All matter set up in type must be plated in some permanent form, and preserved for future printing. Electrotyping, which furnishes the usual means, was too expensive to be practiced in this case, and recourse was had to the more inexpensive method of making a permanent impression of the type upon sheets of brass. The difficulty of securing a distinct impression of each point in the brass required a wider separation of the points, and consequently when the musical system was first adopted a larger letter was used, though still on the same body.

Subsequently, the invention of tinplate stereotyping by Mr. B. B. Huntoon did away with the brass plates, but still left a larger type than was desirable, which, from motives of economy alone, had been retained.

The dimensions of the Boston line letter are not germane to the New York System, and hence do not furnish a proper standard for that system.

In this view, it will be seen, no statement of space occupied in books of literature or music as now printed in the Boston line and the Braille, compared with the New York Systems, which ignores these facts, can be either fair or conclusive as to the merits of the latter. When a font of type which conforms to the requirements and easy possibilities of the New York System shall have been produced, we shall be able to make a just comparison; and I hazard nothing in saying that the superiority of the New York Point System over the Roman forms will be as manifest in respect to compactness as it now is in respect to tangibility and general utility.

The subject of Musical Notation is replete with minute details which need not be introduced here, as the Criticism on this side of the subject can be disposed of under some general considerations. And first of the matter of space.

The Criticism says: "With a view of determining the question of space some comparisons were recently made. *Burgmüller Studies, Op.* 100, *are printed in both the Wait and the Braille systems. They were both executed, of course, without thought of a comparison being made.* They are of easy grade and may be fairly considered as representative of their class. The 1st, 8th, 16th and 25th studies were chosen. Comparisons were made with *such portions* of the studies as were printed in point in the Boston edition. *Differences of composition* made this course necessary."

In the first clause we read, this whole set of studies, twenty-five in all, has been printed without thought of a comparison. In the third clause, we read that the comparison was made with "such portions" as were printed in the Boston edition. What portions? Why, the 1st, 8th, 16th and 25th studies. But as the whole work had already been printed, as stated in the first clause, why print "portions" as the 1st, 8th, 16th and 25th? Evidently for the very purpose of making a comparison, of which it is said there had been no thought, and it is admitted that "differences of composition made it necessary." And so it appears that these four studies were printed in Braille *with* the thought of making a comparison.

As to the mode of the comparison, the first study will serve as a sample for all. The Criticism assumes that the *space* may be determined by considering the study as printed in each system in a single continuous line, and then comparing the number of *linear* inches in each. Thus—

Linear inches in No. 1, Braille, 155½
Linear inches in No. 1, New York, 248

These figures represent a line without *depth*, which is meaningless, the Braille line having a depth of three points, and the New York line a depth of *two* points, as will be seen by reference to the cuts, pp. 19 and 20. The Criticism conveniently ignores this fact—as if area had only one dimension. The depth of the Braille line being 50 per cent. greater than that of the New York line, 50 per cent. must be added to the length of the Braille line, viz., 155.5 + 77.7=233.2. The difference then is 15 inches, or 6 + per cent.

But again, it must be borne in mind that this specimen of New York was printed in the excessively large type heretofore referred to. The same piece, No. 1, when written in the ordinary New York guide, gives a line of 204 inches two points deep, against a Braille line of 233 + reduced to the same standard, an excess in Braille of 29 inches, or 14 + per cent.

So of the statement in square inches. The Criticism gives study No. 1, in Braille 75 and in New York 84 + sq. inches. Here

again advantage is taken of the great size of the type in which the New York System appears.

In written form, which approximates a proper scale for type, Study No. 1 requires 59 + sq. inches, against 75 sq. inches in printed Braille, which is an excess of 27 + per cent.

The space occupied by these four studies, when written in full form, in each system, according to the rules of each, is as follows, ignoring fractions:

	New York.	*Braille.*
No. 1, sq. inches	59	62
No. 2, " "	63	67
No. 3, " "	72	88
No. 4, " "	123	121
Total	317	338

But let us view the case from another standpoint.

Czerny, Op. 261, has also been published in both systems. It has 80 pages in Braille and 64 pages in New York (large type), an excess of 25 per cent. in Braille. These publications, according to the standard of the Criticism, meet all the requirements, viz.:

"They were both executed without thought of a comparison being made. They are of easy grade, and may be fairly representative of their class." Were I to adopt the course pursued in the Criticism this statement would be left with the reader as it stands. But the statement would mislead the reader in exactly the same way in which the Criticism misleads. The fact is that this edition of Czerny, Op. 261, an elementary work, was published in a dispersed style in Braille, with wide spaces between the lines, for the evident purpose of making the reading more easy for beginners. To leave the reader with the impression that this publication is a fair representation of the Braille would be more than reprehensible; and the same is equally true of the New York publication, for the reason that it is printed in the large type to which I have referred, and with portions of many pages left blank. And yet this is precisely the style of statement and argument which marks the Criticism from the first page to the last. It is somewhat curious that the title of Burgmüller Study No. 1, the first one of those selected for the so-called comparison, is "La Candeur." The suggestiveness of this title seems, however, not to have been appreciated, for candor is a quality of which the Criticism is utterly devoid.

In respect to other matters, such as capacity for musical expression, labor of writing, and the like, an examination leads to conclusions corresponding to those reached in regard to the matter of space. One or two passages may be noticed. The Criticism says:

"As another instance of ambiguity we may consider the case of the *natural* and the *discontinuance* sign. Made exactly alike, there is absolutely nothing to distinguish them except the amount of blank space following them, which involves a difficulty hard in itself, and often made more complicated by attempts at 'justifying' in the printed music."

"Among other things calculated to embarrass the learner of the Wait system it may be mentioned that in many cases the meaning of a character is determined not merely by the points which designate it, but also by the amount of space on one or both sides. * * * * It is needless to say that in Braille no such burden is demanded of the student."

"The Wait system has had recourse to signs, the arbitrariness of which is enough to appall the student."

The hollowness of these passages as arguments against the New York System will appear at a glance. The first two paragraphs state facts in its favor, viz., the significance of both signs and spacings, but the tone in which they are stated implies that the double aid derived from sign and space is a hindrance. Nothing could more clearly show a lack of apprehension than this.

Blank spaces when used in a regular manner and with fixed relations become clearly significant. Indeed, they are tangible because they are *felt* to be smooth or unoccupied spaces of definite size, some separating the parts of a whole, others separating wholes, or serving to distinguish an auxiliary from a principal sign. As for arbitrariness, all signs used in typography, whether tangible or letter press, are arbitrary. Knowledge and use does not render them less arbitrary, but only more common or conventional. A citation from actual experience will give an effective and sufficient answer to these, and also to all other derogatory, disparaging and misleading statements of the Criticism.

Children of nine years of age, who only seven months ago began studying the New York Musical Notation, including the structure of the signs, their meaning and rules for their use, together with reading and writing, now learn and recite their lessons by their own reading—from Köhler, Op. 190, and from the music of Spindler, Gurlitt and others, written for this grade.

They readily distinguish the difference between a *natural* and a *discontinuance* sign, which so puzzles the authors of the Criticism. They know the spacings of one, two or three blanks and their effect. They have learned the simple lesson that difference of place, relation or combination gives to the same sign a different meaning. They know 2 in the place of units from 2 in the place of tens. In this as in any other study there is no difficulty so "hard in itself" that it cannot be easily resolved, under the guidance of a competent teacher (or without a teacher, as has often been done), so that children may play at shuttlecock and battledoor with the "burden" under which the authors of the Criticism are utterly crushed.

Take another case. A boy of twelve years, who entered this school, September, 1891, began the study of the Musical Notation in March, 1892. As he could not be placed in a regular class at this time he received his instruction in this subject with his piano lessons, of which he has had two of 45 minutes each in each week. At the end of six weeks, with twelve such lessons, he had learned the signs for the notes, with their values, the accidentals, octaves, intervals, time marks, fingering and many other signs, so as to read intelligently the elementary exercises of Köhler, Op. 190, his lessons being assigned in that book and learned by his own reading.

These cases are not exceptional but typical, and illustrate the common experience of teachers and pupils. They furnish conclusive proof that the system is simple, logical and lucid, and that it furnishes a course over which the young learner, by easy and rapid steps, may gain those most important advantages, self-help, independence in study, and freedom from the crippling dependence of key-board dictation.

With this demonstration of the availability of the New York System during the first months and even weeks of study by children, let us glance upward to see if there is a line of constant ascent and where it reaches. The Criticism speaks of the New York System as "a maze of meaninglessness," from which it would appear that these beginners have just entered the edges of an impenetrable fog, through and out of which there is no discernible path. If the Criticism is correct, if the New York System is a "maze of meaninglessness," instruction could not be carried on in regular steps and grades, and there could be no order or advancement. If, on the contrary, it is found that by and through this system there is regular and orderly instruction and advancement, then the Criticism is wrong.

There are at this time pupils of both sexes, studying along the line of ascent, in every grade, up to and including the music prescribed for the Associateship and Fellowship degrees of the American College of Musicians, in both Organ and Piano. This music comprehends the works of the masters in polyphonic, sonata, and free styles. One of these students, a young man not yet nineteen, who after five years' instruction passed the severe examinations in demonstrative and theoretic Organ, Harmony, Counterpoint, Form, Acoustics, History and Terminology, and secured the Associate degree of the College, is now studying the Fellowship grade. During the past seven months, besides reviewing the Associateship music, he has written in the New York System, and learned and recited therefrom, the following organ music of the Fellowship grade:

Bach,	Sonata, D minor	12	pages,	staff	notation.
"	Toccata, D minor	6	"	"	"
Guilmant,	Sonata, D minor	30	"	"	"
Hesse,	Theme and Variations	11	"	"	"
Saint-Saëns,	Elevation, E major	4	"	"	"
" "	Rhapsodie No. 1	6	"	"	"
Rheinberger,	Pastoral Sonata, Op. 88	15	"	"	"
Thiele,	Chromatic Fantasie and Fugue	15	"	"	"

Every step of this work has been accomplished solely with the New York System of Musical Notation, which is thus shown to be a complete educational ladder, on every round of which pupils may be found in the various stages of advancement.

Lest it may be thought that these pupils are specially set apart for the study of music, I may say that such is not the case, their literary studies being carried on with music. The young man referred to, in addition to his organ music, has studied regularly during the past year Advanced Arithmetic, Physics, Music History, Typewriting, Harmony, Composition, Piano and Piano-tuning.

I have cited these facts from the experience of the New York School, not because they are peculiar to that school, but simply because they are matters of personal observation. Similar results may be observed in other schools where the New York System has been properly taught.

Among many errors of the Criticism the following may be noted:

The table of signs of the New York System put forth as "complete" omitted many signs which were in use and accessible in published works. The statement that the *discontinuance* sign "has no counterpart in Braille, being unnecessary," and which implies that this sign is needless, does not present the case correctly.

The reader is aware that the effect of a *sign* in music is often continuous, and that it must have an end as well as a beginning. Having a sign to indicate the entrance of a given effect, as for example a slur, it is necessary to indicate its end. For this purpose a certain sign has been adopted in the New York System, which in the specified conditions indicates "effect ended."

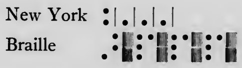
So, also, in the Braille system the end point must be indicated; but instead of effecting this by means of a special *discontinuance* sign, it is done by making the sign which indicated the effect *twice* before the *first* note, and then *once* again before the *last* note of the passage.

And so, while the Braille has no special sign that is a "counterpart" of the one in question, it has a mode of doing the same thing, although often in a manner more cumbersome and less desirable.

The statement that the *natural* and *discontinuance* are "made exactly alike" does not state the case correctly, for the sign is not properly made until it is put into its proper relations.

So of the implied objections that this same sign *begins* f, ff, fff, p, pp, ppp, etc. One might as well object to the alphabet because b begins book and boot and boom, in which case the distinguishing sign or letter, t, k or m, in the words of the Criticism, "is so far removed that a distinct forward movement must be made in order to reach it before the exact nature of the character is ascertained."

Let us glance at the case of ppp, cited in the Criticism, as a sample illustration:



How much more simple is Braille than New York? How much more of a "distinct forward movement" must be made in the New York than in the Braille? The former covers 8 points in length, 5 appearing to the touch; the latter covers 12 points in length, with 15 appearing to the touch.

The insinuation that the New York Notation "cannot write the introduction to the Sonate Pathetique" has no justification. It is based on the pretended inability to express a $\frac{1}{128}$ note in the New York Notation. A Brailleist should never stumble over a matter of this kind. For, supposing there were no other way, he should resort to his cardinal principle of making the same sign stand for two different things of the same kind, and write a series of $1/8$ notes, which the reader, after due inspection, would construe not as eighths, but as $\frac{1}{128}$ notes. But there is a better way—better because it is unequivocal, so that the Sonate Pathetique can be and has been correctly written in the New York Notation.

But while our friends have been throwing so much school dust about this matter, it is a little amusing to find that in one of the pieces cited by them, viz., Liszt's Hungarian Rhapsodie No. 2, there is in the first bar with the $\frac{1}{128}$ notes an essential sign for which there is no equivalent sign in Braille, viz., a triple dot. Of course there is a way of expressing the indicated values; still no sign for triple dot is given in the "complete" tables of the Criticism. The case is worth citing as illustrating in part the weak and captious character of the Criticism.

The Criticism says: "The Braille does not represent the first interval, because it is evidently unnecessary."

Every work on Harmony or Counterpoint speaks of this interval and represents it. It is customary when two voices, as soprano and alto, come together on the same tone to represent them in staff notation by a note with a single head and two stems, one turning upward, the other one downward, or in case of whole notes by two open heads on the same line or space. One voice is sounding with the other at the interval of a prime. Whenever voices occur in chord formation they are expressed by interval signs, and it is consistent, if not necessary, to treat primes in the same manner as other intervals.

The Criticism says that the use in Braille of a single sign to represent two note values, viz., one sign for a whole or a $\frac{1}{16}$ note, another for a ½ and a $\frac{1}{32}$, etc., is not a "necessity."

If the use of such equivocal signs for note values is not based upon some necessity incident to a vertical formation, why should such an anomalous mode of expressing time values have been chosen? A tangible notation cannot be superior to the staff notation which it represents, nor can the sense of touch be superior to the sense of sight in the number, comprehensiveness and rapidity of its impressions. The staff notation has eight specific signs for time values, viz., whole, ½, ¼, ⅛, $\frac{1}{16}$, $\frac{1}{32}$, $\frac{1}{64}$, $\frac{1}{128}$. Will any one contend that there would be any advantage in reducing the number to four, so that each note should stand for either of two values, to be determined by the reader as he glances along from measure to measure? The impressions of sight are gained much more rapidly than those of touch, and the mental operations based thereon are correspondingly more rapid. But will any one propose to reduce the difficulties of time in the staff notation by reducing the number of notes to four, and giving to each an equivocal value?

It avails nothing to say that every such equivocation can always be resolved, for it still remains that they are always there to be resolved. These ambiguous time signs form no part of the staff notation, and they ought not to enter into a tangible equivalent of that notation.

It is said that the use of equivocal time signs in the Braille System is not a necessity, but matter of choice, and that the users of Braille justify the choice, which the Criticism says, "has resulted in giving a simplicity to time values compared with which the Wait System is labyrinthine." That is, ambiguity results in simplicity, and the specific time symbols of the staff notation, which have an exact counterpart in the New York Notation, are "labyrinthine," whatever that may mean. A single consideration will show that the adoption of equivocal time values was necessary, as there was no alternative. The vertical base form ⠿ gives 63 different single signs. Any addition can only be gained by compounding. Each of the seven scale tones, C, D, E, F, G, A, B, may have either of

the eight time values, whole note, half note, etc. Therefore to give each of the seven tones eight specific values as in the Staff Notation would require 56 signs out of the 63, leaving only seven for all other uses. As these would be entirely inadequate, resort must be had to compounding. Of the two evils, the lesser was chosen. The reader will see that the difficulty is inherent, and inseparable from the vertical structure. And yet the Criticism would have its readers believe that the recourse to ambiguous time values was in no way necessary, but altogether optional and wise. Still, the working rules of the Braille Notation state how certain ambiguities may be avoided. But in attempting to avoid one error another is made, for the mode prescribed involves a violation of Musical Form and of correct grammatical writing.

Referring again to the pictorial tables given in the Criticism, I would say that they convey a wrong impression as to the compactness of the Braille signs, by placing them much closer together than in actual practice, or than they should be relatively to the New York signs.

Further, a mere table of signs is of little value for comparison in the absence of working rules, which often prescribe that a sign must appear twice or three times to indicate the effect, instead of only once, as the reader will infer from the table.

Other errors in the Criticism might be noticed, but want of time forbids.

I desire here to disclaim any feeling of antagonism, any spirit of captious criticism, or any wish unduly to disparage the Braille Musical Notation. It is a noble creation, having a most beneficent design.

In reference to my advocacy of the New York System, I may say, that had Dr. Howe and Mr. Chapin accepted my proposal that we should unite upon the Braille Code, I should have devoted my best energies to improving and upbuilding that system, which in some form or other would now be in general use in the United States. But the proposal was not accepted. Meantime the New York System has been recognized and widely used. There are those who, for one reason or another, have not chosen to use this system, and although it seems that by the general adoption of the New York System every desired end may be attained with less expense and in much less time than can be otherwise, still no one should be factiously hindered or obstructed in the adoption of such means as may be deemed best under various conditions and circumstances. The work of development has only just begun. Where one instrumentality cannot be used, another should be employed, and the fittest will be sure to survive.

In conclusion, the following brief chronological summary will be instructive to all, and especially to those who have more recently entered into the work.

Prior to 1868 punctographic writing was little known, and no books in embossed points had been printed for the general use of touch readers.

In 1868, or prior thereto, a union on the basis of the Braille System was proposed by me to Dr. S. G. Howe and to Mr. Wm. Chapin, but the proposition was not accepted by either of these gentlemen.

In 1871, the subject having been for some four years urgently pressed upon the attention of the educators of the blind in this country, it was brought before the meeting of educators held at Indianapolis in that year. After much deliberation, the Convention approved the New York System, and passed a resolution declaring that the New York System "should be taught in all institutions for the education of the blind."

In 1872, at the meeting in Boston, I presented the outlines of a system of Musical Notation, for the express purpose of learning whether the plan would meet with sufficient favor to warrant me in carrying it out; for I realized that the alphabetic and the musical codes must go together, and that if a satisfactory music code could not be worked out, which would command approval, as the complement of the alphabetic code, further effort in this direction would be useless. After full discussion, the Convention requested me to go on and perfect the "Musical Notation."

In accordance with this request, and after much study and labor, the "New York Point System of Musical Notation" was published as part of my report for the same year.

In 1876 a committee was appointed to examine and report upon the New York and Braille Music Codes, and in 1878 the committee reported in favor of the New York System.

Down to the present time (1892) the work of building up a literature, both general and special, in the New York System has steadily progressed.

From what has been said, the following deductions may naturally be drawn:

1st. Inasmuch as the proposition for a union upon Braille was not accepted when first made, and as down to 1872, when the question was still an open one, no offer or suggestion of such union had at any time been made by others; and inasmuch as the New York System has not only been sanctioned, but has been established in many schools and widely diffused throughout the United States and Canada, duty and the general welfare alike require an adherence to the policy thus fairly and deliberately adopted, until greater progress and wider usefulness can be assured as the result of adopting some other course.

2d. In respect to resources, power of expression in writing, in adaptability for combination with simple lineal signs in printing, in respect to tangibility, smallness of bulk and of cost, the New York Code is superior to any known code on the vertical plan yet proposed. To warrant the substitution of any other system, it is not enough that it should be equal to the New York System; it should be preëminently superior to it on both educational and economical grounds.

3d. The multiplication of different systems inevitably involves a waste of time and resources, and should be avoided whenever possible. Nevertheless, it will not do to adhere too exclusively to the traditions and devices of the past. All progress and development, however, must be based upon methods at once logical and necessary, and should be secured by a policy generous and wise.

WILLIAM B. WAIT.

NEW YORK INSTITUTION FOR THE BLIND,
MAY, 1892.

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